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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/761,479	01/21/2004	David M. Anderson	200309416-1	4380

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EXAMINER	
BROWN JR, NATHAN H	

ART UNIT	PAPER NUMBER
2121	

DATE MAILED: 05/22/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/761,479	ANDERSON ET AL.	
	Examiner	Art Unit	
	Nathan H. Brown, Jr.	2121	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on 21 January 2004.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) 1-29 is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) 1,2,7,8,14,19,24,26 and 29 is/are rejected.

7)☒ Claim(s) 1-29 is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)

2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.

4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .

5) ☐ Notice of Informal Patent Application (PTO-152)

6) ☐ Other: _____.

Examiner's Detailed Office Action

1. This Office is responsive to application 10/761,479, filed January 21, 2004.

2. Claims 1-29 have been examined.

Claim Rejections - 35 USC § 101

3. 35 U.S.C. 101 reads as follows:

> Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

4. Claims 1-29 are rejected under 35 U.S.C. 101 because the claimed invention is directed to non-statutory subject matter. The claims are considered to be directed to an algorithm or software or a computer program that does not meet the standard set forth in the State Street Bank case of being tangible, useful, and concrete. In this instance the claims are not considered to be tangible since no real world result is provided. A system and methods provided for selecting a value set associated with a set of parameters, a real cost function that generates a real cost for a first value set associated with a set of parameters, a genetic algorithm that generates a second value set that is a variation of the first value set, and a cost function approximator that determines an approximate cost; generates a result in the set of reals, which is not tangible and concrete.

Claim Rejections - 35 USC § 102

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for a patent.

4. Claim 1, 2, 7, 8, 14, 19, 24, 26, and 29 are rejected under 35 U.S.C. 102(a) as being anticipated by *Russell et al.* "Artificial Intelligence A Modern Approach", 2003.

Regarding claim 1. *Russell et al.* a value set selection system (*see* Chapt. 4, Informed Search And Exploration, *Examiner interprets each informed search strategy to be a system to select a (optimal) value set.*), comprising: a real cost function that generates a real cost for a first value set associated with a set of parameters (*see* p. 97, "A* search: ...", *Examiner interprets the real cost function to be g(n), the exact cost to reach node (or state) n. Examiner interprets a first value set associated with a set of parameters to be a set (population) of states, where each state is a string over a finite alphabet.*); a genetic algorithm (*see* p. 116, §4.3, Local Search Algorithms and Optimiztion Problems, Genetic algorithms, "A **genetic algorithm** (or GA) is a variant of stochastic beam search in which successive states are generated by combining *two* parent states, rather than by modifying a single state.") that generates a second value set that is a value set variation of the first value set (*see* p. 117, Fig. 4.15, *Examiner interprets a second value set to be a set of (offspring) states.*); and a cost function approximator that determines an

approximate cost based on the real cost and the value set variation between the second value set and the first value set (*see* p. 97, "A* search: ...", *Examiner interprets h(n), a heuristic estimate of the cost to the solution node (state) from the current node (state), n. Examiner further interprets a heuristic estimate of cost to be a function approximator, as it approximates the exact cost to the solution node. Examiner interprets* value set variation to be allele differences between a *current node, n, and a solution node.*).

14. *Russell et al.* teach a system for selecting a value set associated with a set of parameters (*see* Chapt. 4, Informed Search And Exploration), the system comprising: a real cost function that determines a real cost for each of a plurality of real chromosomes that represent different value sets associated with a set of parameters (*see* p. 97, "A* search: ...", *Examiner interprets the real cost function to be g(n), the exact cost to reach node n. Examiner interprets a real chromosome to be a state arrived at by the search implemented by the genetic algorithm. Examiner provides Official Notice that it would have been obvious at the time of the invention to apply the real cost function (as a type of fitness function) to each n in the* plurality (population) of real chromosomes.); a genetic algorithm (*see* p. 116, §4.3, Local Search Algorithms and Optimiztion Problems, Genetic algorithms) that generates a first generation of speculative children chromosomes from parents selected from the plurality of real chromosomes (*see* p. 117, "The production of the next generation of states is shown in Figure 4.15(b)-(e).", *Examiner interprets a first generation of speculative children chromosomes to be states produced from the initial population of states as shown in Fig. 4.15.*), the genetic algorithm generates subsequent generations of speculative children chromosomes from parents selected from at least one of

preceding generations of speculative chromosomes and the plurality of real chromosomes (*see* above), the speculative chromosomes representing incremental differences in the value sets between at least one parent chromosome and an associated child chromosome (*see* Figure 4.15(d), *Examiner interprets "crossover" to generate incremental differences in the value sets between at least one parent chromosome and an associated child chromosome.*); and an incremental cost function that determines speculative costs for a given speculative chromosome based on the incremental difference in the value sets between at least one parent chromosome and an associated child chromosome and the cost associated with at least one of the parent chromosomes (*see* p. 110, "Inductive learning methods work best when …", *Examiner interprets h(n) to be the speculative cost for a given speculative chromosome where h(n) is a linear combination of features $x_1(n)$ and $x_2(n)$ which map incremental differences in the value sets between one parent chromosome (i.e., current state) and an associated child chromosome (e.g., potential goal state) to some real value.*).

19. *Russell et al.* teach a system for determining costs associated with a set of parameter values representing a solution (*see* §4.1, Informed (Heuristic) Search Strategies, p. 95, "h(n) = estimated cost of the cheapest path from node n to a goal node.", *Examiner interprets "a goal node" to be a set of parameter values representing a solution state.*), the system comprising: means for generating real chromosomes representing different value sets associated with a set of parameters (*see* p. 116, §4.3, Local Search Algorithms and Optimiztion Problems, Genetic algorithms); means for determining a real cost of at least one of the generated real chromosomes (*see* above); means for generating a speculative chromosome representing value set variations from at least

one of the generated real chromosomes (*see* above); and means for determining a speculative cost based on the real cost and a difference in value sets of at least one of the generated real chromosomes and the speculative chromosome (*see* p. 110, "Inductive learning methods work best when ...").

24. *Russell et al.* teach a method for selecting a value set associated with a set of parameters (*see* Chapt. 4, Informed Search And Exploration), comprising: determining a real cost of a first value set associated with a set of parameters (*see* p. 97, "A* search: ...", *Examiner interprets the real cost of a first value set associated with a set of parameters, n, to be g(n), the exact cost to reach node (or state) n.*); generating a second value set based on a difference in at least one value of the first value set (*see* p. 117, "The production of the next generation of states is shown in Figure 4.15(b)-(e)."); and approximating a speculative cost for the second value set based on the difference and the real cost (*see* p. 97, "A* search: ...", *Examiner interprets h(n), a heuristic estimate (or speculation) of the cost to the solution node (state) from the current node (state), n, to be a function approximator, mapping n to some number (e.g., the distance–value set variation–from the current node (state), n, to the solution node (state).*).

29. *Russell et al.* teach a computer-readable medium having computer-executable instructions for performing the method of claim 24 (*see* p. ix, §Preface, Using the Web site, first bullet.).

2. *Russell et al.* teach the system of claim 1, the genetic algorithm generates at least one additional value set that is a variation of the second value set (*see* p. 117, Fig. 4.15, *Examiner interprets one additional value set that is a variation of the second value set to be a third generation population produced as shown in Fig. 4.15.*).

7. *Russell et al.* teach the system of claim 1, further comprising a first group of value sets represented as real chromosomes (*see* p. 117, Fig. 4.15, *Examiner interprets a first group of value sets represented as real chromosomes as the initial population (of states).*), the real cost function provides corresponding real costs associated with each of the real chromosomes (*see* p. 97, "A* search: …", *Examiner interprets the real cost of a first value set associated with a set of parameter values, n, to be g(n), the exact cost to reach node (or state) n. Examiner provides Official Notice that it would have been obvious at the time of the invention to apply the cost function (as a type of fitness function) to each n in the initial population.*), and a second group of value sets represented as speculative chromosomes (*see* p. 117, Fig. 4.15, *Examiner interprets a second group of value sets represented as speculative chromosomes as a subsequent population (of states) produced as shown in Fig. 4.15.*), the cost function approximator provides corresponding approximate costs associated with the speculative chromosomes (*see* p. 97, "A* search: …", *Examiner interprets h(n), a heuristic estimate (or speculation) of the cost to the solution node (state) from the current node (state), n, to be a function approximator (i.e., an approximation of the exact cost to the solution node from the current node). Examiner provides Official Notice that it would have been obvious at the time of the invention to apply the cost function (as a type of fitness function) to each n in a subsequent population.*).

8. *Russell et al.* teach the system of claim 7, the genetic algorithm generates the second group of value sets represented as speculative chromosomes from parents selected from the real chromosomes (*see* p. 117, Fig. 4.15, *Examiner interprets a second group of value sets represented as speculative chromosomes as a subsequent population (of states) produced as shown in Fig. 4.15 from a previous population of parents selected from the real chromosomes by application of the fitness function.*).

26. *Russell et al.* teach the method of claim 25, the first value set is represented as real chromosome and the second and third value sets are represented as speculative chromosomes, the second and third value set being generated by a genetic algorithm (*see* p. 117, Fig. 4.15, *Examiner interprets the first value set is represented as real chromosome to be the initial population at, say generation k, the second value set to be the population at generation k+1, and the third value set to be the population at generation k+2.*).

Allowable Subject Matter

8. Claims 3-6, 9-13, 15-18, 19-23, 25, 27, and 28 objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Correspondence Information

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Nathan H. Brown, Jr. whose telephone number is 571-272- 8632. The examiner can normally be reached on M-F 0830-1700. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Anthony Knight can be reached on 571-272-3687. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306. Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions

on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

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Nathan H. Brown, Jr.
May 11, 2006